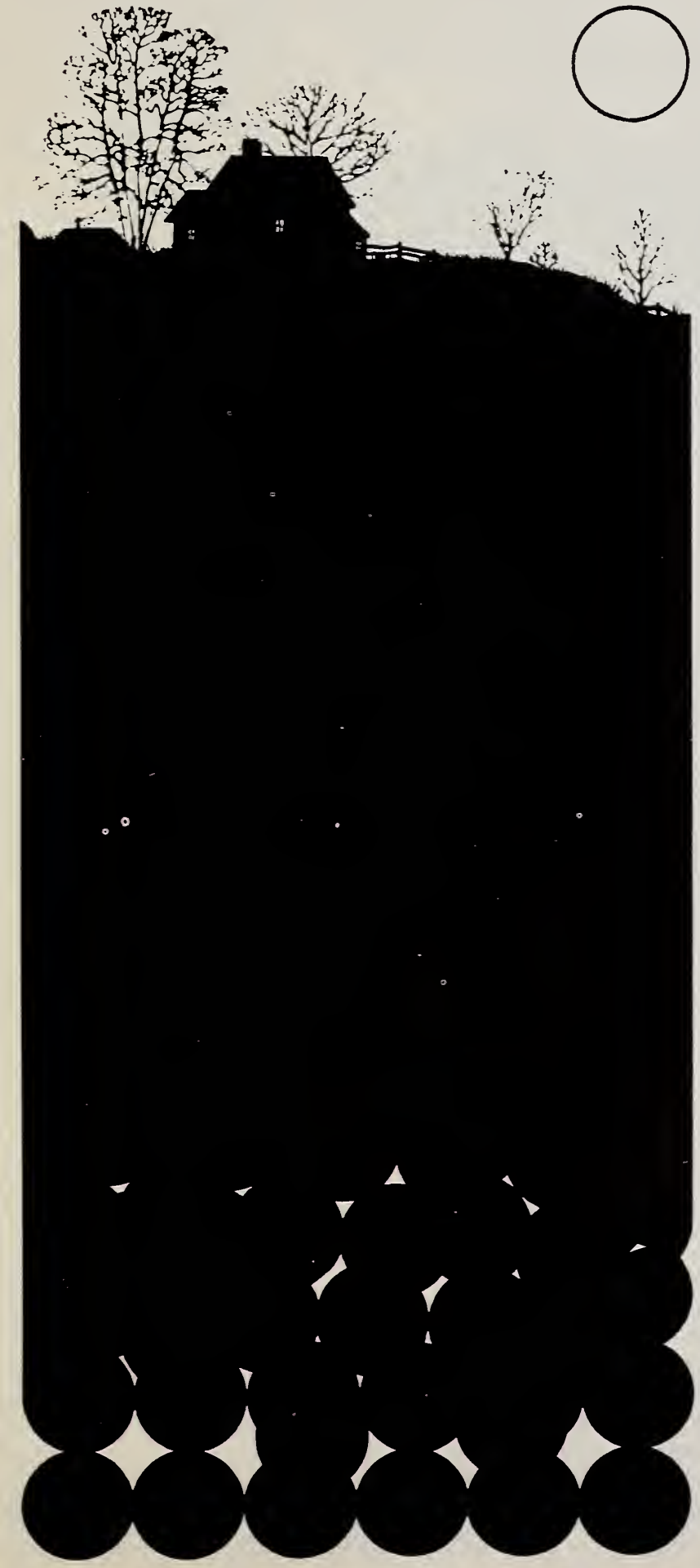
THE FARM INDEX

U.S. Department of Agriculture / September 1974



coping with the coal boom

September confirmed what had come as a shock in August: Bad summer weather slashed earlier expectations of crop yields and reduced estimates of harvested acreage. Only wheat and rice escaped major difficulties. Here's a rundown—

- As of September 1 the all wheat production figure stood at 1,792 million bushels, still a record but down 48 million bushels from the August 1 estimate. This spells another year of low stocks—in the range of 277 to 327 million bushels.
- September's production estimate for feed grains was raised only 1 percent from August to 176 million tons. That's off 14 percent from 1973. Biggest slippage is in sorghum, down 31 percent to 645 million bushels. Corn production, 4,995 million bushels, is seen 11 percent lower.
- Soybean crop is placed at 1,316 million bushels, an upward revision of 2 million from August 1, but this does not account for any freeze damage since September 1. Supply-demand situation continues tight, with carryover projected at only 50 to 100 million bushels next September 1.
- Cotton production, all types, is now put at 13.2 million bales, 3 percent above the August 1 forecast and 2 percent above 1973. Total supply remains near last year's 17.2 million bales—more than enough to cover domestic and export needs.
- The rice crop by September 1 indications is a record 113.5 million hundredweight. Supply will more than offset demand, resulting in a sharp buildup in year-end stocks.

Prospect of costlier feed has dashed hopes for a recovery in milk production this year. Higher prices may limit grain feeding and reduce milk output in the upcoming barn feeding season. For all of 1974, milk production is apt to fall about 1½ percent from 1973's 115.6 billion pounds.

Farm prices of milk, which averaged $7.62 per 100 pounds in August, will climb seasonally in fall and winter, paralleling the expected strength in the products market. Gross income of dairy farmers should approach $9½ billion—up from $8.1 billion in 1973 and a new record.

Retail dairy prices will creep higher before the year is out but the increase will not be the likes of last fall and winter. In June and July, retail prices actually went down—the first month-to-month declines in almost 2 years.

Outlook '74

On the demand side, commercial use of milk in all dairy products (milk equivalent, fat solids basis) is trailing 1973, due mainly to sluggish sales in the fluid market. The drop for the year, however, should be less than in January-July when milk use fell 1 percent. Butter consumption may hold its own in view of the recent jumps in competing margarine prices. Cheese sales should stay above year-earlier levels, although they probably won't repeat the sharp rises of early 1974. Dairy economists say the expected growth in supplies of meat, plus possible weakness in retail meat prices, will make cheese less attractive as an alternative source of protein.

Prices received for all farm products will average about a tenth higher in 1974, and will probably stay strong into 1975 as grain supplies dwindle and livestock inventories are worked down. A big spurt in 1974 crop prices—seen a third above 1973—will more than offset an expected 6-percent decline in prices for livestock and livestock items. But realized net farm income this year will be shaved by racing farm costs.

Cattle prices will retreat in October-December as marketings gather momentum. Choice slaughter steers may average $1-$2 under the summer level of near $45 per 100 pounds. Prices of other classes of cattle may be sharply lower than summer quotations.

Beef will stay in plentiful supply through the first half of next year. Tightest situation could come in the spring when pastures green up and cattle go back to grass. Prices of fed cattle might then bounce back to the mid-$40's. Feeder cattle and cow prices might strengthen also.

Liquidation of the U.S. cattle herd next year? Not likely, answers one ERS livestock specialist. He estimates the January 1, 1975 inventory in the range of 133 to 135 million head. Though many cows are being culled from the herd this year, most will be replaced by heifers which are selling at relatively low prices. The 1975 calf crop will again be larger, but perhaps the rate of increase will slow.

To entirely halt the growth in next year's herd will require that cattle and calf slaughter balloon by more than 25 percent. Barring severe drought, increases of that size hardly seem likely.

Average U.S. residents of 18 years and over smoked 208 packs of cigarettes in 1973 and they are expected to puff even more this year. Cigarette use in first half 1974 tallied 311 billion. That's about 4½ percent ahead of last year's pace.

ERS economists note that strides in cigarette prices have lagged those for most other consumer items in the past year. In July, the price of a pack of filter-tip kings was up only about 5 percent from a year earlier. Also, the Federal cigarette tax of 8 cents has not changed since 1951, and for the past 2 years the hikes in State cigarette taxes were the least in a decade.

But in 1975, cigarettes will cost more. Tobacco production costs are drifting upward. These will almost certainly be passed on to consumers.

Next to most other major field crops, this year's tobacco crop looks to be in good shape. Most of the tobacco comes from outside the areas hit by summer drought. The September 1 estimate put production near 2 billion pounds . . . up 13 percent from 1973.

Despite the output gain, tobacco carryover into the 1974-75 marketing season will shrink approximately 10 percent, and total supply is seen 2 percent smaller. The projected supply of just under 5 billion pounds falls somewhat short of meeting the demand anticipated by manufacturers and exporters.

Mark this on your calendar: December 2-5, time of the 1975 National Agricultural Outlook Conference at USDA in Washington, D.C. Theme this year is "U.S. Agriculture in the World Economy." As usual the conference will feature presentations and panel discussions, with emphasis on the outlook for agriculture and the general economy next year.

Deciduous fruit growers expect to turn out a crop about as large as last year's. By the September forecast, production will total almost 11 million tons. Not all fruits will share in the increase, however.

Apricots, pears, sweet cherries, and dried prunes head the list of smaller crops this season. These will be partly offset by moderately larger output of fresh nectarines and plums, California clingstone peaches, and tart cherries. Production forecasts of apples, grapes, peaches (excluding California clingstones), and strawberries are about the same as in 1973.

No relief from high retail fruit prices is in sight, at least through December. Prices for fresh fruit will stay above year-earlier levels, reflecting skimpier remaining supplies of citrus fruit from the 1973/74 season as well as perky demand and steeper marketing costs. Ditto for prices for frozen and canned items. Fatter fruit bills, on the other hand, could meet with consumer resistance here and abroad, resulting in reduced domestic use and/or decreased export demand.

Contents

Features

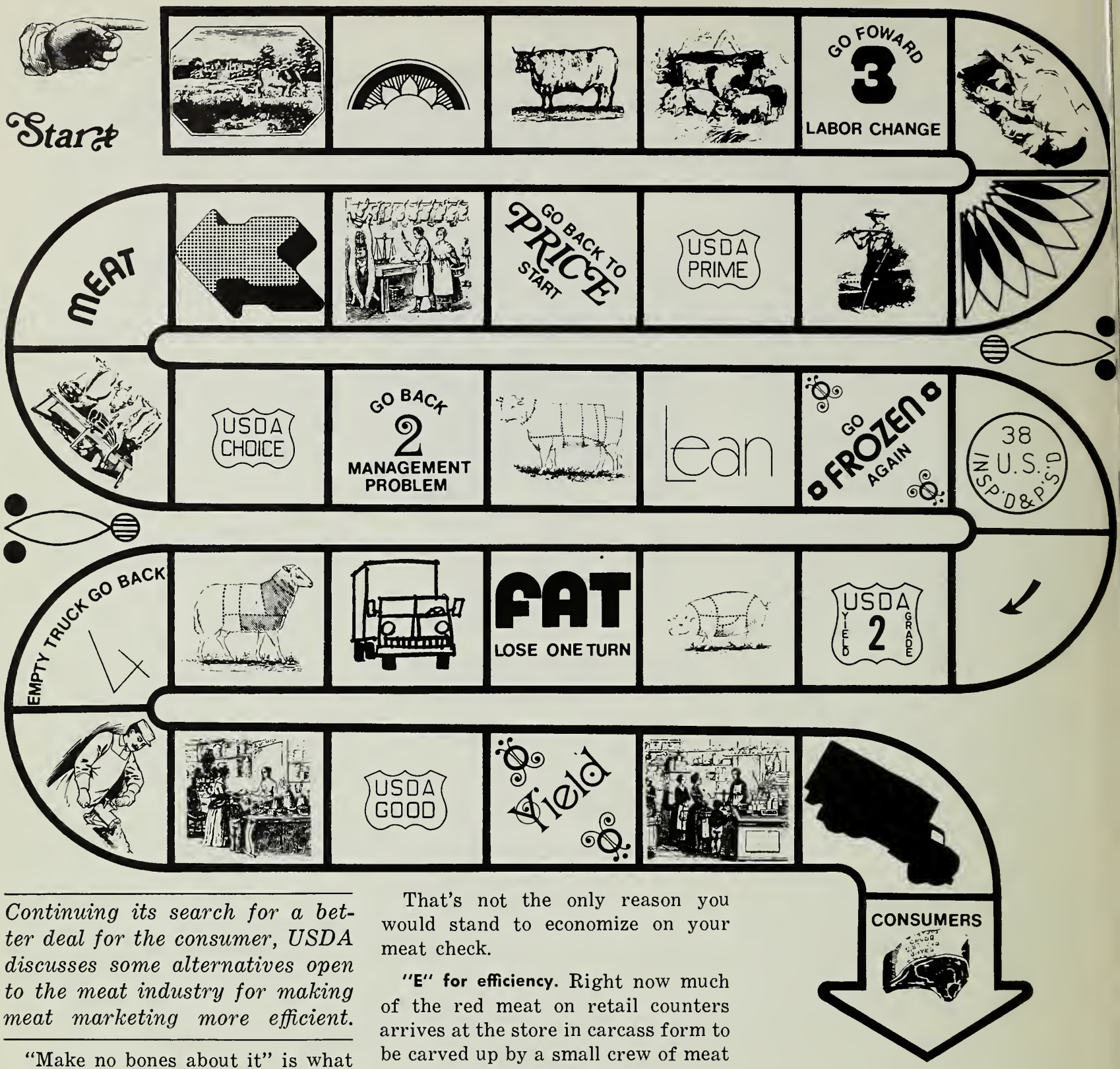
Departments

Martin Schubkegel, Editor

Diane Decker, Associate Editor; Virginia Broadbeck, Staff Editor; James Schleyer, Art Director.

The Farm Index is published monthly by the Economic Research Service, U.S. Department of Agriculture. September 1974. Vol. XIII. No. 9.

Readers are invited to write for the research materials on which we base our articles. Address queries to The Farm Index, Rm. 1664, Economic Research Service, U.S. Department of Agriculture, Wash., D.C. 20250. Please cite article titles when ordering.



trimming the fat from meat marketing

Continuing its search for a better deal for the consumer, USDA discusses some alternatives open to the meat industry for making meat marketing more efficient.

"Make no bones about it" is what many a shopper says when getting the butcher to cut meat to order. That bone—plus the fat and other parts destined for the consumer's garbage can—only tips the scale and runs up the bill.

What if much of the bone and waste had already been removed by the time your local store got the meat? You'd come out ahead. The less the meat weighs as it's shipped from slaughter house to retail store, the more you save in transportation charges.

That's not the only reason you would stand to economize on your meat check.

"E" for efficiency. Right now much of the red meat on retail counters arrives at the store in carcass form to be carved up by a small crew of meat cutters. If large packing plants or central meat cutting plants did the job, retail prices could be shaved because assembly line meat cutting is more efficient, and hourly wage rates are generally lower than in retail stores.

These and other pointers for reducing meat costs are brought home in a recent report of a special USDA task force that investigated farm-to-retail price spreads for red meat.

The task force's report opens with this observation:

Stubborn retail prices. In late 1973 and through first half 1974, the difference between livestock prices at the farm and beef and pork prices at retail was greater than in any year. These spreads widened at a time of falling livestock prices, but retail meat prices stuck at relatively high levels.

The report goes on to say, "This not only upsets both the consumer and farmer but it poses some searching questions concerning the organization, efficiency, and responsiveness of meat marketing."

In other words, the task force sees room for improvement in the performance of the meat marketing system.

Key recommendations. The first recommendations of the task force call for a further shift to box beef and central meat cutting, and a further shift to frozen beef. Box beef is beef cut up into primal or fairly large cuts before shipping to the retailer. In central meat cutting, the meat is fully cut up and packaged.

Centrally cut meat would become even more economical if shipped in frozen form. This would eliminate most of the packaging by retail outlets, extend the meat's shelf life, reduce the number of deliveries to stores, and almost completely eliminate shrinkage and spoilage losses.

Tighter schedules. The transportation system could be streamlined, too. For example, through tighter scheduling of rail cars and trucks, carriers could be assured of using all their capacity. At present the carriers often take meat to consumer centers and return home empty. This inefficiency adds to the tab paid by consumers. Another route to trimming transport costs is by allowing trucks to pull two trailers on all interstate highways. Many States now prohibit this. And a recent attempt to write it into Federal law failed.

Retail meat costs could be pared also with changes in labor and management practices. In some areas, these have slowed the move to box beef and centralized cutting, according to the task force. Retail meat cutters fear loss of their jobs if meat cutting were relocated from the store to a central cutting warehouse. In addition, unions contend more jobs would be lost in consumer centers than would be gained at the packer-processor level if we moved to box beef.

Labor blocks. Then there's the obstacle of labor contracts. Some require a minimum number of personnel at each retail outlet. And the contracts define tasks so narrowly that efficiency of store operations is dragged down.

On the transportation end, productivity is hindered by labor contract restrictions on loading and unloading trucks and by contract terms limiting the number of stops and the number of drivers.

The task force did not assign an upper limit to how much consumers could save on meat costs if the industry went along with the above recommendations. But, the report says that "a minimum of 5 cents per retail pound could be saved from complete adoption of box beef and central cutting, conversion to frozen beef, eliminating of trucks returning empty, and changes in labor-management obstacles."

What's a Price Spread?

The farm-retail spread, or margin, for beef or pork is the difference between a monthly average composite price per pound of cuts at retail and the farm value of the equivalent quantity of live animals less the value of byproducts.

Spreads for meat include charges for such activities as transporting animals to packing plants, slaughtering animals and processing products, packaging the product, and shipping meat and products to major consuming areas. Each activity involves expenditures for labor, energy, capital, taxes and depreciation of fixed assets. All such costs, plus profits earned by firms, are included in the price spread or margin reported by USDA.

By the way, the price spread gives no indication of whether the industry is efficient or inefficient, or whether costs for marketing, processing and distribution are reasonable or excessive.

Closing the spread. To put this into perspective, in July 1974 the farm-retail spread for beef was about 47 cents a pound. So, a saving of 5 cents a pound would mean a narrowing in the spread of roughly 10 percent. That 5 cents also represents around twice the combined profit margin of packers and retailers in July.

The task force had other things to say on ways to step up the efficiency of meat marketing. No attempt was made to assess the impact on retail meat prices, but consumers would certainly stand to benefit.

On grade standards for beef, the task force believes "real potential exists for reducing excess fat on beef through greater use of an accurate yield grading system."

What's the difference? The report explains that the quality grades now in use (such as Prime, Choice, and Good) are meant to measure eating quality—tenderness, juiciness, and flavor. Yield grades, by contrast, indicate the amount of closely trimmed retail cuts you can get from carcasses or wholesale cuts, and these grades directly reflect muscling and quantity of trimmable fat.

USDA maintains that grades should be revised as marketing conditions change. The Department recently heard from the cattle industry and consumer groups about their views on changing the grade standards. USDA is now evaluating their proposals, and is developing information to provide additional precision in yield grades.

The task force also sees a need for expanded and improved information on prices and price spreads.

[Based on Farm-Retail Price Spreads for Red Meat, Report of a Special Task Force to Earl L. Butz, Secretary of Agriculture, August 1974. Task force members were: Chairman, Don Paarlberg, Director of Agricultural Economics; John C. Blum, Associate Administrator, Agricultural Marketing Service; Kenneth R. Farrell, Deputy Administrator, Economic Research Service; Fred J. Fullerton, Deputy Administrator, Animal and Plant Health Inspection Service; and Nancy Steorts, Assistant to the Secretary.]

"Big" Farm Tally Tops 100,000

The number of "big" farms in the U.S. has surpassed 100,000 for the first time.

We had 109,000 farms last year in the highest sales bracket of $100,000 and over, according to ERS's latest issue of *The Farm Income Situation*. That's more than a 50-percent increase from 1972's 70,000 farms in this sales class and a 374-percent increase from 1960's total of 23,000.

Still, large farms represented less than 4 percent of all farms in 1973. That's a bigger share than the 1 percent in 1960 when they took in 17 percent of all cash receipts from farming. By 1973, however, they claimed 46 percent of all receipts.

In contrast to the growth by the largest farms, farms with sales below $20,000 have been declining—in number, percentage of total farm numbers, and share of all cash receipts from farming.

For example, the number of farms earning between $5,000 and $10,000 fell 60 percent, from 660,000 in 1960 to 262,000 in 1973. Their share of all cash receipts from farming fell from 15 to 2 percent over the same period.

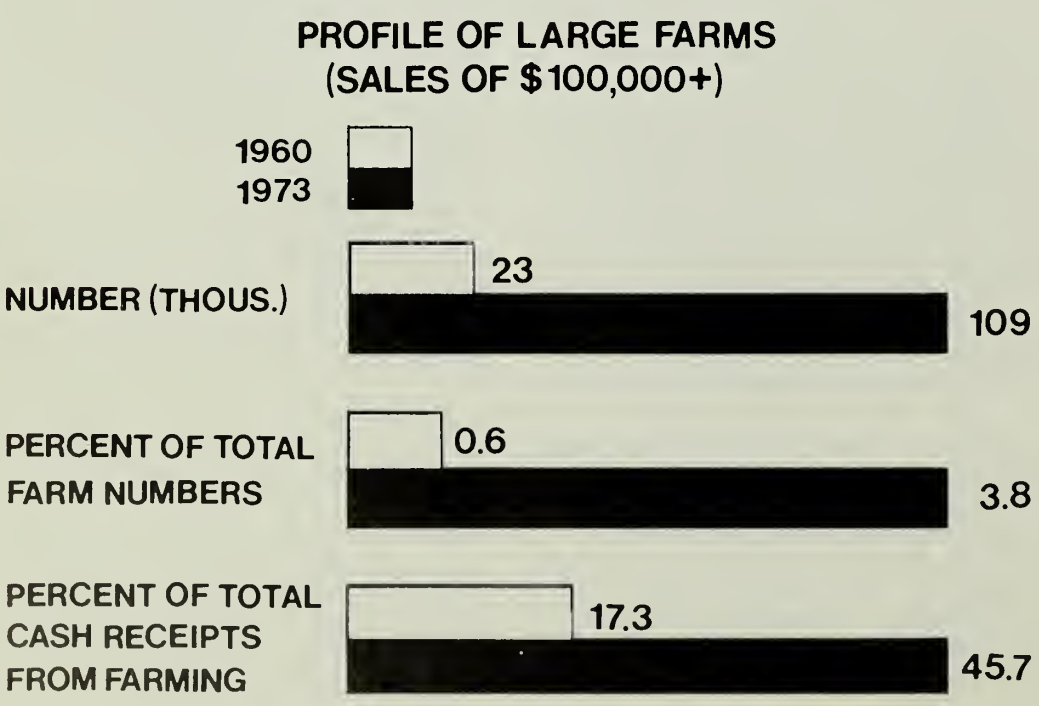
Changes in prices received by farmers influence cash receipts from farm marketings and, therefore, the distribution of farm income by sales classes. This was especially evident in 1972 and 1973, when farm prices rose sharply and led to a huge expansion in receipts from farm marketings.

Compared with 1967 as a base, farm prices rose gradually until 1971, increasing a total of 12 percent in the 4-year period. But prices received by farmers jumped another 13 percent in 1972 alone, and then 37 percent more in 1973.

Of course, farmers earn money outside of farming, too. Off-farm income is most important on the smallest farms.

In 1973, farm families with sales of less than $2,500 received an estimated $13,930 in income from off-farm sources. This is more than 12 times their estimated net farm income. Families with sales of $100,000 or more also had off-farm income, but it equaled less than 10 percent of their net farm income.

[Based on article, "Income of Farm Operator Families by Value of Sales Classes," in *Farm Income Situation*, FIS-224, July 1974.]



The Sugar Scene: Unprecedented Surge In U.S. and World Prices

If a six-pack of your favorite soft drink costs a fourth or so more than last year, don't blame it all on soaring glass, metal, or transportation costs.

They're partly responsible, but the major contributor is sugar. Not since 1920 have sugar prices climbed so high. And soft drinks, which contain 10 to 15 percent sugar, are reflecting that gain.

Soft drinks use nearly a fourth of annual sugar deliveries—making the beverage industry second only to the market for household use in consumer-size packages. Prices for most soft drinks are likely to increase further during the fall . . . again due largely to advancing sugar prices.

In August, sugar brought over $32 a hundredweight (New York spot)—up some 300 percent in scarcely more than a year. Experts describe the current market as "tight"—supplies are adequate but at very high prices.

Sugar prices on the world market have also shattered records, but have fallen shy of the peak U.S. level. Historically, when sugar prices advance, world market prices tend to top U.S. prices. But June, July, and August proved exceptions this year. Trade sources suggest that speculation has played some part.

Stepped-up raw sugar prices in turn spawned higher wholesale and retail prices. Wholesale prices rose so rapidly during mid-1974 that the reported retail price was less than the wholesale price during June and July. Retail prices will head higher for some time to adjust to current high wholesale prices.

World sugar production for 1974/75 is projected at 92 million short tons (raw value)—up 3 percent from a year earlier and a record outturn. Brazil, France, South Africa, the Philippines, and Australia all expect bigger output this year. Cuba and the Soviet Union may also harvest larger sugar crops.

If projections are borne out, 1974/75 production will top use by roughly 2½ million tons. World output the previous year surpassed use by nearly 2 million tons.

As the 1973/74 crop year began, world sugar stocks totaled some 17 million tons, or almost a fifth of that year's crop. World stocks increased nearly 2 million tons by the close of the 1973/74 crop year, and are expected to swell an additional 2½ million tons by the end of the 1974/75 crop year. Growing supplies and carry-in stocks should ease the pressure on sugar prices.

In the U.S., sugar production is expected to drop from last year's 5.9 million tons (raw value) despite production gains in some parts of the country. An anticipated 8-percent dip in beet sugar output will more than offset an expected expansion in production of cane sugar.

Higher yields are expected to boost cane sugar production in the State of Texas, while Hawaiian output may decline due to less acreage. Beet sugar acreage is off nearly 2 percent from last year.

Official estimates of hurricane damages to Louisiana's sugar cane crop were not yet available as of mid-September.

During first-half 1974, the U.S. imported close to 3 million tons (raw value) of sugar—some 16 percent over a year earlier. Bigger shipments from Colombia, Central America, Dominican Republic, Peru, Philippines, Taiwan and West Indies accounted for most of the gain.

Sugar shipments from Hawaii to mainland U.S. during January-June fell some 220,000 tons below last year, due partly to a longshoremen's and warehousemen's strike that closed Hawaiian plantations from March 9 to April 16.

Traditionally, sugar imports rank second only to green coffee in value. But this year, current high sugar prices could well reverse that time-honored situation.

[Based on material by Frederick D. Gray, National Economic Analysis Division, in the *National Food Situation*, NFS-149, August 1974.]

Custom harvest on the Great Plains Part 2

Tired of fighting the high cost of farming, Al Blake is going back to teaching. He's determined to sell out . . . lock, stock, and combine.

On second thought, maybe he won't sell the combine. Summertime he could do custom harvesting, make a few bucks, and still keep a hand in agriculture.

How much could Blake make?

ERS had similar questions about custom combine operations, so it ran an income-expense survey as part of a larger study on interstate combiners and their crews (Farm Index, June 1974).

In the survey, 34 combine operators who ply the Great Plains agreed to keep detailed record books of their operations. Some of the men had only one combine, whereas others ran as many as six.

The larger outfits naturally reported bigger gross income than others, if for no other reason than they could cover more ground. For example, outfits with six combines had an average return above expenses of $43,000 versus about $3,200 for the one-combine operations.

But when it came to net returns per combine per acre, some interesting differences turned up.

For all combines, the per acre return above cash expenses averaged almost $2.85 per combine in the 1972 harvesting season. The three-combine outfits took in the most—about $3.60—and the four-combine outfits, the least—less than $2.35.

One-combine operators netted a bit over $2.65 an acre per combine, but they harvested more acres per day than the others—almost 29 acres against an average of 16 acres for all combines. The number of acres a combine can harvest each day is a factor of travel and set-up time and the actual time spent harvesting. The one-combine group worked an average of 51 days in the harvest season, whereas all combines averaged 125 days. Since the one-combine size group had a shorter campaign time and less travel, there were more acres harvested per day.

Most small grains were combined at a basic rate per acre. By size of combine operator, there was little difference in rates, ranging from $5.10 to $5.65. (In 1974, reported rates are about double those of 1972.) Per acre rates for row crops showed greater variation ($8.12-$9.95) mainly due to crop differences and extra services provided, such as hauling. Over 40 percent of the row crops, however, were combined at a basic rate per bushel, which ranged from 5 cents to 21 cents.

Among other findings—the one-combine crews reported fewer facilities for housing people, and the 1972 value of equipment reported by one-combine crews was less per unit than for other crews.

[Based on manuscript Income and Expenses of Interstate Custom Combiners, by William F. Lagrone and Charles C. Micheel, with the Commodity Economics Division.]

coping with the coal boom

It's hard to imagine our "wide open spaces" getting another rush of people, reminiscent of pioneer days.

Yet that could be one of the offshoots of a coal boom in the West—particularly in the Northern Great Plains. This sparsely settled area would have to make some difficult social and economic adjustments to cope with the influx of people attracted by coal development.

Why a coal boom . . . and why in the West?

A coal boom because coal development on a large scale has been called for by Project Independence, the Administration's crash program to make the U.S. self-sufficient in fuel. Its coal goal for 1985 is 2 billion tons annually—roughly three times the current output.

The West because its coal is low in sulfur pollutants and relatively cheap to produce.

Juxtaposition. But thrusting a major industry upon a lightly populated region with an agricultural economy is sure to raise some thorny problems. That's why the Northern Great Plains Resources Program (NGPRP) was formed—to pinpoint the likely impacts of coal development. The program is a joint venture of the U.S. Departments of Agriculture and the Interior, the Environmental Protection Agency, and the governments of Wyoming, Montana, North Dakota, South Dakota, and Nebraska.

The NGPRP, which is examining all aspects of the potential coal boom, divided its research into several key areas of concern. ERS headed a work group to assess the social and economic impacts of alternative levels of coal development.

In 1970, the study area's population stood at 434,967—up only 1½ percent from 1960. With a minimal level of coal development, population in 1985 might reach 470,000. But with extensive development, population could swell to 627,000 or 46 percent over 1970.

Local impacts of population growth are much greater than total numbers indicate. Individual facilities—coal mines, coal-fired thermal electric plants, and gasification plants—attract a concentration of people to relatively small areas.

Massive workforce. For example, it would take about 4,000 workers to build a 250-million cubic-feet-per-day coal gasification plant, and roughly 800 workers to operate it. The plant could use up to 10 million tons of coal a year—requiring some 200 construction workers to open the mine, and 400 men to work it.

Smaller towns would inevitably feel the crunch. In Campbell County, Wyo., for instance, total employment in 1970 was 4,800. With minimal coal industry growth, employment might reach 7,600 in 1985. But at the highest projected level of coal development, employment could soar to 22,000—and population to 50,000.

Hit on three sides. This deluge of new residents would create problems for rural economies, society in general, and local governments.

Rural economies would have to adjust to new levels of wages and employment. For example, a coal gasification plant is planned for Mercer County, N.D. Workers in such plants generally earn much more than the typical Mercer County laborer.

But Mercer County workers would have limited chances of stepping up to many of the higher-paying jobs in the new plant, as gasification plants employ mostly skilled and professional personnel who would be drawn in from other areas.

Some local labor may be recruited for semi-skilled jobs, such as con-

struction work and mine operation. Support and service industry attracted by coal development would also provide jobs. But most of the skilled labor—carpenters, welders, electricians, etc.—would come from outside the study area.

Employment prospects are about the same for the various electrical generating plants that are planned for the Northern Great Plains coal region.

Competition for labor will nonetheless affect farming, ranching, and agribusiness. Farm equipment operators, in particular, may be lured to new jobs in mining and construction.

Farm labor costs will accelerate, requiring agricultural businesses to change capital investment and management. Consolidation of farms and ranches will also pick up, as some operators seize the opportunity to leave agriculture, and others are forced out.

Water worries. Coal development will also generate competition for water, a scarce commodity in the area's coal regions, where rainfall averages from 10-17 inches a year. Coal mining requires little water directly, but may disrupt ground water supplies.

The large coal-fired electric generating plants anticipated for the area will each consume from 1,400 to 16,000 acre-feet a year with typical plants in the high range.

And gasification plants take from 10,000 to 17,000 acre-feet a year.

In 1969, close to 700,000 acres of cropland were irrigated in the study area, using some 1 million acre-feet of water. By 1985, water needed for coal could reach some 370,000 acre-feet; by 2000, as much as 872,000 acre-feet.

Since energy companies could afford to pay considerably more than farmers for water resources, agriculture may have to make some major adjustments. Other industries may be affected as well.

Agriculture will also vie directly with coal for rail transportation. Even now, inadequate transportation poses a barrier to rapid development of Western coal resources.

The National Petroleum Council estimates that railroads will have to spend up to $6 billion for new locomotives and hopper cars to meet coal industry demands in 1985. This translates into stiff competition for Northern Plains grain, which travels the same routes as coal.

Single-base economy. Economic problems in the Northern Great Plains have traditionally stemmed from the area's heavy dependence on one main industry—agriculture.

This raises the question—might energy uproot agriculture as the economic base for the Northern Great Plains? Put another way—is it possible or wise to swap the problems of a known one-base economy for the problems of an unknown single-base economy?

The future of coal as an energy source is far from certain. The Northern Great Plains may have enough coal to last 400 years. But how long will coal figure prominently in the energy picture?

Coal has been in and out of style before. Too, scrubbers to remove sulfur from stack gases may be fully operational by 1985—possibly ending the low sulfur advantages of Western coal.

Alternatives. By 1985, oil shale and geothermal technology will advance further. And nuclear energy will command a giant share of energy production.

Natural gas may reduce some anticipated increases in coal production. According to the Ford Foundation's Energy Policy Project, natural gas production would quadruple if the government allowed prices at the wellhead to reach 60-80 cents per 1,000 cubic feet—versus around 25 cents last February.

Since that price would fall well below the price of coal-produced gas, the stepped-up supply of natural gas might well dampen interest in coal gasification and related coal extraction.

Coal development would accelerate urbanization of rural society in the Northern Great Plains. This would produce some "growing pains" and occasional conflicts of interest. Old-

time residents would have to adjust to many new faces, more traffic, more noise, and a generally faster pace of life. Some residents would no doubt oppose rapid change, whereas others would embrace it.

Crowded classrooms. Overcrowding of schools poses an immediate social problem. An argument goes, however, that once adjustments are made, new larger schools will allow more specialized—and thus better—teaching. On the other hand, some Montana residents fear that academic standards will decline from the pre-boom years, when most graduates went on to college, and "did well."

Better wages that would result from coal development might not be a boon to everyone in the area. The elderly and others on fixed incomes who can't join the boom would be hard hit by escalating prices, rising housing costs, and other inflationary pressures.

Indians, too, would be affected by coal development on some reservations. A major stumbling block is that government of reservations falls under a separate system of law. If non-Indians flock in, the Indians could become a minority on their own reservations, thus losing their legal and other institutions.

Indians traditionally face the complex problem of modifying their governing institutions to cope with the faster pace of a more highly developed area.

Complaints. Very few newcomers indicate they are satisfied with the coal area's social, recreational, health, and entertainment services. Their views may stand in direct contrast to those of old-timers, providing a source of future conflicts.

The impacts of coal development will prove particularly severe on local governments, which must bear the brunt of guiding and financing community services. In the past, the sparsely populated coal country has neither needed nor supported elaborate government and service systems.

Some small governments will be hard pressed to keep pace with rapid change, especially in filling the service needs of a thriving, modern community and finding the revenues to pay for them.

This is borne out in Big Horn County, Mont., where coal related development is expected, and in neighboring Sheridan County, Wyo., where probably no coal will be mined, but where 70 percent of Big Horn's construction and permanent workers will probably live.

In Big Horn County, where the pressure will be relatively light, construction is expected to put a load on school taxes starting in 1975. But no additional revenue is expected until a generating plant starts operating in 1980. Following this delay, revenues from coal development will more than exceed the school budget.

The problem is reversed in Sheridan County. Not only will the load on the school system be heavy, but it will never have top revenues from coal development. When shouldering the burden of increased population, the county will have to find other ways to meet school costs.

Coping with such problems will probably require some innovation. For example, instead of tax breaks to attract industry, prepayment of taxes before construction might be a solution.

Hassle with housing? Housing is another complex issue facing rural governments. To house the inflow of workers, should local officials rely on existing towns— or explore the concept of new towns? When and how should governments or power companies provide capital for new home construction?

Are there benefits from concentrating coal processing plants versus scattering them? What about commuting patterns and public transportation?

To answer these and other questions, local governments will need help in setting priorities, developing sound planning systems, and providing for citizens to take part in decisionmaking.

Citizens are already voicing concern that their future is being decided by people in far-off government or corporate boardrooms. And they're demanding a say in the kind of adjustments they'll be making to cope with the coal boom.

[Based on "Social and Economic Impacts from Strip Coal Mining in the Great Plains," paper presented at Great Plains Agricultural Council at Sioux Falls, S.D., July 25, 1974, and "Social and Economic Impacts of Potential Coal Development in the Northern Great Plains," paper to be given at Coal and Environment Technical Conference and Equipment Symposium, Louisville, Ky., Oct. 23, 1974, by Frank Osterhoudt, Natural Resource Economics Division.]

Cotton Ginning Costs Up Despite Capacity Boosts, Midsouth Study Shows

Like everything else, gin costs have gone up—cotton gin costs, that is.

In the fourth annual study of cotton gin operating costs in the Mississippi Delta area, ERS economists found that average total costs rose from $18.54 per bale in 1971/72 to $19.28 in 1972/73.

This 74-cent hike occurred despite greater ginning volumes and an overall boost of 5 percentage points in average capacity utilization. From 1971/72 to 1972/73, the amount of cotton processed during the ginning season jumped from an average of 59 percent of capacity to 64 percent.

Cost increases were more pronounced for those gins where capacity utilization was relatively unchanged. Their cost hikes averaged $2.15 to $3.82 per bale in 1972/73.

In contrast, substantial increases in capacity utilization lowered costs by averages of $1.05 and $1.56 for some gins. In general, researchers found that average operating costs per bale tended to be lower as gin size and volume increased.

Economists based their study on a random sample of 48 cotton gins, representing about 8 percent of the total ginning capacity of the Delta region.

[Based on the manuscript Cotton Gin Operating Costs in the Midsouth—1971/72 and 1972/73, by Joseph L. Ghetti and Zolon M. Looney, Commodity Economics Division.]

Cottonseed meal and fish protein concentrate may not sound like gourmet fare, but new foods such as these can beef up many of the world's protein-deficient diets.

Not so long ago, a little known product sat wedged between hamburger dinner mixes and instant spaghetti on grocery shelves.

It wasn't the hottest item in the market—many people not only didn't know how to use it, they didn't know what it was.

Well, this obscure little product has since marched to the meat counter to take its rightful place beside the ground chuck and sirloin tips. It is textured vegetable protein —a meat extender—and one of the first large-scale commercial productions of non-animal and non-cereal protein sources for U.S. consumers.

Products such as this one captured public attention last year when meat prices soared to new heights. Soy protein meat extenders gained some consumer support at that time, an encouraging sign to food scientists and economists seeking new sources of protein acceptable to consumers.

The problem of insufficient protein foods at the world level—largely due to their inequitable distribution among rich and poor consumers—has been recognized for some time. Growing concern about the world's population-food supply dilemma has focused even more attention on the need to expand the quantity and quality of low-cost protein to satisfy world demand.

Proposals and problems. There are several ways to provide more protein for human consumption: making more naturally high-protein foods available to areas in short supply; breeding to produce higher quality protein in locally grown foods; fortifying foods with missing amino acids —the building blocks of protein—or with other protein sources such as soy flour; providing high-protein food supplements; and creating new high-protein food products.

At this time, most food experts agree that the technological exper-

tise exists to produce new protein foods on a fairly large scale. But two important roadblocks must first be reckoned with—consumer acceptance and cost.

No matter how nutritious, inexpensive, and convenient, new products will be useless if people are unwilling to eat them, for whatever reason. And if research, production, and marketing costs are high, the ultimate retail price could well limit consumer purchases.

Incomplete protein. For the bulk of the world's population, cereal grains are the major source of both food energy and protein, but the protein they provide is incomplete. Like all foods except whole eggs, wheat, corn, and rice are partially deficient in one or more of the eight essential amino acids not synthesized by the body.

The human body needs each of these amino acids simultaneously, and in a given proportion, to carry out protein synthesis. If even one is partially missing, all of the other amino acids are reduced by the same degree. Consequently, unless the deficient nutrients are provided by other foods eaten along with cereals, some of the cereals' protein is wasted.

Since so many people in developing countries already depend upon grains for food, fortifying cereals with protein sources containing the missing amino acids or adding the amino acids themselves appears to be one feasible method for improving a large number of deficient diets.

Adding amino acids. Amino acid fortification improves the quality of the protein already present in a cereal and therefore increases the amount of that protein the human body can use.

If substances such as protein-packed oilseed flours and concentrates are used as fortifiers, they have the added advantage of upping the crude protein content of the cereal at the same time the quality is being boosted.

And an important bonus is that fortification does not require major changes in eating habits and social customs to upgrade nutrition.

However, at this time there are some drawbacks to fortifying cereals on a wide scale, and perhaps the most serious is the question of cost.

Cost problems. In less developed countries, cereal grains are usually processed in innumerable small village mills where it would probably be too expensive to set up the equipment and trained personnel needed to carry out fortification. Also, the price of the fortified product, although cheaper than animal protein foods, could still be too high for many low-income consumers.

Another promising way to increase the quantity and quality of available protein is breeding crops for higher nutrient content. Until recently, most breeding efforts were aimed at developing higher yielding varieties, but now breeders have produced higher protein wheat, maize, rice, and sorghum.

The major problem here is that a trade-off occurs between high protein content and high yields. Some high-protein grains yield 10-15 percent less than standard varieties even with optimum fertilizer levels.

Breeding benefits. Despite this obstacle, plant breeding may become a very effective nutritional tool. Not only are total protein content and the amounts of individual amino acids under some degree of genetic control, but each of these components apparently tends to be inherited separately by the plants. Thus, it may be possible for a wide range of nutritional compositions to be tailored to the needs of particular consumers.

Elsewhere in the plant kingdom is another major source of protein—and one which can be readily adapted to new and unconventional foods. The oilseed family, which includes soybeans, cottonseed, and peanuts, has already provided a number of high-protein products that can be used either as food supplements or as meals in themselves.

Among them are soy, cottonseed, and peanut flour; soy protein concentrates and isolates; beverages such as soymilk, which can be used as milk substitutes for infants and young children; and textured protein products that can simulate meat, seafood, nut, and fruit and vegetable flavors, textures, and shapes.

Oilseeds are in reasonably abundant supply, and some type of oilseed can be cultivated in almost any country.

But even more important—in many cases they are relatively inexpensive and have a high nutritive value. Most oilseeds are richer in crude protein than meat or fish.

Oilseed drawbacks. Despite their versatility and the advances made in oilseed processing technology, there are several disadvantages to each of the major oilseeds which must be remedied before widespread use of some of their new products can be achieved.

Cooked soybeans, for example, have a characteristic flavor and odor that some consumers find offensive. Additional processing is required to rid soybeans of this "beany" taste.

Cottonseed protein is bland in taste, but it contains an undesirable pigment called gossypol, which reduces growth and depresses appetites in humans. Removing gossypol raises the cost of cottonseed protein, and it currently can't compete with soy products.

Plant breeders have successfully produced gossypol-free cotton plants, but the new varieties appear more vulnerable to insects, and their seeds give some products a greenish-yellow color that is intensified by cooking.

Need for processing. Peanut products generally enjoy a wide degree of consumer acceptance, but they are not as nutritionally complete as soybean and cottonseed protein. New methods of processing peanuts may help to overcome this drawback.

Of the other major oilseeds, sunflower and safflower seeds offer good possibilities for human foods and have the added advantage of being widely adapted to semiarid areas. But processing technology for these plants lags somewhat behind the advances made with soybeans.

Another protein source which is undergoing close scrutiny for new uses is one of man's oldest and most abundant foods—fish. Only a few of the more than 20,000 species of

fish are currently being utilized in human diets.

However, increasing the amount of available fish protein would require not only upping the number of fish caught and the overall supply of fish, but also developing new methods for converting fish into high-protein food supplements and products.

New foods from the sea. New products could greatly broaden the usefulness and dissemination of fish protein since raw fish are highly perishable, and many abundant species are not appealing to human sight, smell, or taste when fresh.

Heading the list of newcomers is fish protein concentrate (FPC). Made by removing fats and water from fresh fish, FPC is really a family of products ranging from bland flours to coarse meals with a fishy taste and odor, to highly flavored pastes resembling meat extracts. It makes use of the whole fish, or any of its parts, and can be produced from species not otherwise used for human consumption.

From the frigid surface layer of Antarctic waters comes another potentially important marine food source, a small crustacean called krill. On a dry weight basis, krill contain about 40 percent protein, and they can be used to prepare a powder with a 74-percent protein content. Possible harvests have been estimated at 100 to 500 million tons annually.

Unexploited plant sources. Looking to the more distant future, virtually untapped protein supplies can be found in the numerous varieties of algae and leafy green plants growing in abundance throughout the world.

Both of these potential human foods have high biological value on a par with animal protein. All green plants and most algae are photosynthetic, which means they can synthesize carbohydrates in the presence of sunlight and can produce all of the essential amino acids.

In addition, green plants are a valuable source of Vitamin A, and algae provide a number of vitamins and other nutrients.

One type of algae—spirulina—has been eaten since ancient times by tribes in the African country of Chad. With a 65-70 percent protein content, spirulina has proved to be an excellent additive to foods used in weaning babies.

However, before algae and green plant foods find their way onto dinner tables, more research is needed to refine protein extraction processes for human tastes.

Another unconventional source of protein is derived from unicellular or simple multicellular organisms such as yeast, bacteria, fungi, and protozoa. Called single-cell protein, or SCP, it is the only potential food that is completely independent of agricultural inputs, climatic conditions, and soil quality.

Microbial food sources. The small microbial organisms producing SCP have been grown on a variety of materials, or substrates, including molasses, liquors, brewery wastes, petroleum fractions, natural and industrial gases, and food industry, dairy, and paper and pulp wastes.

This in itself could be a real stumbling block to eventual consumer acceptance of SCP. Many people are repelled by the thought of eating foods grown on industrial waste materials, or even livestock products which use SCP as a feed supplement.

On the other hand, humans have been eating some form of SCP for thousands of years. Any fermented food contains bacteria, yeast, and other microbial cells, and some popular examples include cheeses, beer and other alcoholic beverages, yogurt, soy sauce, and vinegar.

Continuing research. Consumer tastes aside, other factors relating to the cost and safety of SCP cultivation will probably relegate it to use primarily in animal feeds for some years to come.

At this time, capital investment requirements and production costs are too high for SCP to be competitive with other protein sources in most parts of the world, and more research is needed to develop efficient methods for harvesting the cells.

Scientists are also continuing to explore the effects on man of nucleic acids and other possibly toxic substances contained in the microorganisms or their substrates.

The rapid growth rates of these tiny protein-producers give SCP great potential to fill at least part of the world's protein gap. Whether or not it realizes that potential will depend on how well the problem areas are resolved.

[Based on the manuscript New and Unconventional Sources of Protein for Human Food: A Review of Alternatives by Kathryn Kayser, Foreign Demand and Competition Division.]

Snacks Pack Protein

Not even candies and hors d'oeuvres are safe from food scientists these days.

In a search for high-protein nourishment, USDA researchers zeroed in on widely consumed snack foods as a likely means of improving human nutrition. And they may have struck paydirt with products based on panir, a semi-soft Indian cheese.

Panir is made by the Indians and Pakistanis from whole milk curdled with lemon juice. However, an Agricultural Research Service chemist found that acid whey from cottage cheese could be used instead of lemon juice to prepare a high-protein base for appetizing snacks.

The ARS panir was made by boiling milk, then mixing it with cottage cheese whey until a curd formed, and finally, after draining, kneading the curd to a creamy paste.

For candy, the panir paste can be flavored with fruit, coconut, peanut butter, or honey, shaped into balls, and coated with melted chocolate. After standing a few days to mellow and blend flavors, the candies are ready to eat.

For hors d'oeuvres, the panir can be seasoned with chives, red peppers, or other herbs and spices, dipped in bread crumbs, and deep-fried in garlic flavored butter oil.

Nutritionally, the hors d'oeuvres contain 20 percent protein and 28 percent fat after cooking, and the candies have much more protein and calcium than what's found in commercial vanilla creams, peanut butter, or coconut candies.

Recent Publications

Improving the Export Distribution System for Fresh Fruits and Vegetables. T. Q. Hutchinson, L. A. Hoffman, and R. L. Parlett, National Economic Analysis Division. MRR-1027.

Transportation costs for fruits and vegetables shipped from the Western U.S. to Western Europe are perhaps higher than they need to be, researchers concluded, because of inefficiencies in shipment scheduling, handling, and information flows. Increasing prices for land transportation, costs of specialized equipment for perishables, and European import tariffs also contribute substantially to distribution costs. In their study of these problem areas, economists calculated least-cost routings using all modes of transportation, and considered other potential means for reducing costs and improving service.

The U.S. Orange Economy: Demand and Supply Prospects 1973/74 to 1984/85. Jim L. Matthews and Abner W. Womack, National Economic Analysis Division, and Ben W. Huang, Commodity Economics Division. Reprinted from the *Fruit Situation*, February 1974. ERS–250.

Smaller supplies and higher prices for the rest of the 1970's and more oranges in the 1980's mark ERS's projections of the orange economy to 1985. This report describes the development of the econometric model used to make these projections, and discusses the model's assumptions, variables, and equations.

Protecting American Agriculture: Inspection and Quarantine of Imported Plants and Animals. Vivian Wiser, National Economic Analysis Division. AER-266.

Since the earliest colonial settlers arrived with seeds, plants, and livestock from abroad, imported plant and animal pests and diseases have posed problems for American farmers. This report traces the historical roots of USDA's inspection and quarantine activities, as well as the roles of other Federal agencies in pest control.

Single copies of the publications listed here are available free from The Farm Index, Economic Research Service, Rm. 1664–So., U.S. Department of Agriculture, Washington, D.C. 20250. However, publications indicated by (*) may be obtained only by writing to the experiment station or university. For addresses, see July and December issues of The Farm Index.

Improving Marketing Systems in Developing Countries: An Approach to Identifying Problems and Strengthening Technical Assistance. Reprinted from FEDS Staff Paper 7, February 1972, in cooperation with the Agency for International Development. FAER-93.

Improving food marketing in developing countries is seen as an important factor in the war on hunger and in sustaining high-yield technology for increased crop production. This report provides a systematic approach to marketing analysis and focuses particularly on means of measuring marketing efficiency and on identifying problem areas. Also discussed are the implications of alternative marketing policies, including socio-economic issues and the problems of organizing marketing reforms.

Development and Spread of High-Yielding Varieties of Wheat and Rice in the Less Developed Nations. Dana G. Dalrymple, Foreign Development Division, in cooperation with the Agency for International Development. FAER-95.

The use of high-yielding wheat and rice varieties has expanded sharply in the developing nations since the onset of the "green revolution" in the mid 1960's. This report reviews the development of these varieties and documents their yearly spread in several Asian and African countries from 1965/66 to 1972/73. Major emphasis is placed on the semidwarf wheats and rices bred in Mexico and the Philippines.

Econometric Models of Cash and Future Prices of Shell Eggs. Sujit K. Roy, Texas Tech University, and Phillip N. Johnson, Texas Agricultural Extension Service. ERS Tech. Bull. No. 1502.

The major purpose of this study was to develop a series of econometric models which analyze economic relationships in the egg industry and provide short-term predictions of shell egg prices. Data from 1961-69 were used to estimate the basic price-determining forces in the cash and futures market for eggs. Although the models were designed to help the Commodity Exchange Authority in regulating shell egg futures trading, the results of the study may be of interest to economists, traders, and others involved with the egg industry.

Changes in Exchange Rates: Impact on U.S. Grain and Soybean Exports to Japan. Bruce L. Greenshields, Foreign Demand and Competition Division. ERS-Foreign 364.

Since 1970, significant changes have occurred in exchange rates between the Japanese yen and the currencies of Japan's major suppliers of food and feed grains. However, by estimating what would have happened if exchange rates had held steady from 1971-73, economists concluded that these fluctuations had little effect on U.S. grain and soybean exports to Japan.

Margarine Consumption and Prices. Stanley A. Gazelle and Paul D. Velde, Commodity Economics Division. Reprinted from the *Fats and Oils Situation*, June 1974. ERS-560.

In the past 40 years, impressive growth in the production and use of margarine has enabled it to replace butter as the number one spread on American dinner tables. This report discusses many of the factors behind margarine's expanding popularity, and analyzes annual variation in margarine prices in relation to ingredient costs and retail butter prices.

Economic Trends

Item	Unit or Base Period	1967	1973 Year	1973 June	1974 April	1974 May	1974 June
Prices:							
Prices received by farmers	1967=100	—	172	172	183	175	165
Crops	1967=100	—	164	170	205	201	199
Livestock and products	1967=100	—	179	174	169	158	142
Prices paid, interest, taxes and wage rates	1967=100	—	145	146	164	165	166
Family living items	1967=100	—	138	138	157	159	160
Production items	1967=100	—	146	149	167	166	168
Ratio [1]	1967=100	—	119	118	112	106	99
Wholesale prices, all commodities	1967=100	—	134.7	136.0	152.7	155.0	155.7
Industrial commodities	1967=100	—	125.9	126.0	146.6	150.5	153.6
Farm products	1967=100	—	176.3	182.3	186.2	180.8	168.6
Processed foods and feeds	1967=100	—	148.1	151.8	159.1	158.9	157.4
Consumer price index, all items	1967=100	—	133.1	132.4	144.0	145.6	147.1
Food	1967=100	—	141.4	139.8	158.6	159.7	160.3
Farm Food Market Basket: [2]							
Retail cost	1967=100	—	142.3	140.4	159.9	160.4	160.2
Farm value	1967=100	—	167.0	166.5	172.6	163.9	161.7
Farm-retail spread	1967=100	—	126.6	123.9	151.9	158.2	159.2
Farmers' share of retail cost	Percent	—	46	46	42	40	39
Farm Income: [3]							
Volume of farm marketings	1967=100	—	116	92	83	89	93
Cash receipts from farm marketings	Million dollars	42,817	88,590	6,104	5,548	5,545	5,400
Crops	Million dollars	18,434	42,346	2,431	1,812	1,801	2,300
Livestock and products	Million dollars	24,383	46,244	3,673	3,736	3,744	3,100
Realized gross income [4]	Billion dollars	49.9	97.0	93.2	—	—	98.4
Farm production expenses [4]	Billion dollars	38.3	64.7	62.9	—	—	74.5
Realized net income [4]	Billion dollars	11.6	32.2	30.3	—	—	23.9
Agricultural Trade:							
Agricultural exports	Million dollars	—	9,404	1,376	2,014	1,795	1,705
Agricultural imports	Million dollars	—	6,459	664	878	890	845
Land Values:							
Average value per acre	Dollars	[6]168	[7]247	—	—	—	[8]310
Total value of farm real estate	Billion dollars	[6]181.9	[7] 259.5	—	—	—	[8]324.0
Gross National Product: [4]	Billion dollars	793.9	1,294.9	1,277.9	—	—	1,387.3
Consumption	Billion dollars	492.1	805.2	799.0	—	—	869.1
Investment	Billion dollars	116.6	209.4	205.1	—	—	211.8
Government expenditures	Billion dollars	180.1	276.4	273.3	—	—	304.4
Net exports	Billion dollars	5.2	3.9	.5	—	—	2.0
Income and Spending: [5]							
Personal income, annual rate	Billion dollars	629.3	1,055.0	1,047.2	1,125.2	1,135.2	1,143.5
Total retail sales, monthly rate	Million dollars	26,151	41,943	41,167	44,283	44,894	44,593
Retail sales of food group, monthly rate	Million dollars	5,759	8,811	8,598	9,689	9,795	9,782
Employment and Wages: [5]							
Total civilian employment	Millions	74.4	[9]84.4	[9]84.5	[9]85.8	[9]86.0	86.2
Agricultural	Millions	3.8	[9]3.5	[9]3.4	[9]3.5	[9]3.5	3.3
Rate of unemployment	Percent	3.8	4.9	4.8	5.0	5.2	5.2
Workweek in manufacturing	Hours	40.6	40.7	40.6	39.3	40.3	40.1
Hourly earnings in manufacturing, unadjusted	Dollars	2.83	4.07	4.04	4.25	4.33	4.38
Industrial Production: [5]	1967 = 100	—	126	126	125	126	126
Manufacturers' Shipments and Inventories: [5]							
Total shipments, monthly rate	Million dollars	46,449	71,398	70,639	79,050	81,117	81,166
Total inventories, book value end of month	Million dollars	84,655	120,870	113,025	128,438	130,936	133,488
Total new orders, monthly rate	Million dollars	46,763	73,836	74,291	82,059	85,264	85,176

[1] Ratio of index of prices received by farmers to index of prices paid, interest, taxes, and farm wage rates. [2] Average annual quantities of farm food products purchased by urban wage earner and clerical worker households (including those of single workers living alone) in 1959–61—estimated monthly. [3] Annual and quarterly data are on 50-State basis. [4] Annual rates seasonally adjusted second quarter. [5] Seasonally adjusted. [6] As of March 1, 1967. [7] As of March 1, 1973. [8] As of March 1, 1974. [9] Beginning January 1972 data not strictly comparable with prior data because of adjustment to 1970 Census data.

Sources: U.S. Dept. of Agriculture (Farm Income Situation, Marketing and Transportation Situation, Agricultural Prices, Foreign Agricultural Trade and Farm Real Estate Market Developments); U.S. Dept. of Commerce (Current Industrial Reports, Business News Reports, Monthly Retail Trade Report and Survey of Current Business); and U.S. Dept. of Labor (The Labor Force and Wholesale Price Index).

UNITED STATES GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS, WASHINGTON, D.C. 20402
OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE
& FEES PAID
U.S. DEPT.
OF
AGRICULTURE
AGR 101

To stop mailing ☐ or to change your address ☐ send this sheet with new address to The Farm Index, ERS, U.S. Department of Agriculture, Rm. 1459, Washington, D.C. 20250.

The Farm Index
☆U.S. Government Printing Office: 1974—582-226/2